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Applicant(s): Wim Van Houtum

Docket No.

NL 021308

Application No.

10/537,068

Filing Date

June 1, 2005

Examiner

Kabir A. Timory

Group Art Unit

2611

Invention: **DELAY DIVERSITY IN A WIRELESS COMMUNICATION SYSTEM,**

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Appeal Brief

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TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.  
NL 021308

In Re Application Of: Wim Van Houtum

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/537,068	June 1, 2005	Kabir A. Timory	24737	2611	8817

Invention: DELAY DIVERSITY IN A WIRELESS COMMUNICATION SYSTEM

COMMISSIONER FOR PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:  
October 26, 2007

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Dated:

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Application Serial Number 10/537,068  
Appeal Brief

**IN THE UNITED STATES  
PATENT AND TRADEMARK OFFICE**

Appl. No. : 10/537,068  
Applicant(s): Wim Van Houtum  
Filed: June 1, 2005  
TC/A.U.: 2600/2609  
Examiner: Kabir A. Timory  
Atty. Docket: NL 021308  
Title: DELAY DIVERSITY IN A WIRELESS  
COMMUNICATION SYSTEM

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On: March 17, 2008

By: \_\_\_\_\_  
William S. Francos

**APPEAL BRIEF**

Honorable Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In connection with the Notice of Appeal dated October 26, 2007, Applicants  
provide the following Appeal Brief in the above-captioned application.

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### TABLE OF CASES

1. **W.L. Gore & Associates, Inc. v. Garlock, Inc.**, 220 USPQ 303 (CAFC 1983).
2. **In re Paulsen**, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994)
3. **In re Spada**, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990).
4. **Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.**, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992).
5. **Scripps Clinic & Res. Found. v. Genentech, Inc.**, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991).
6. **In re Rijckaert**, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).
7. **In re Oelrich**, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981).
8. **In re Robertson**, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

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### 1. Real Party in Interest

The real party in interest as assignee of the entire right and title to the invention described in the present application is Koninklijke Philips N.V. having a principle place of business at Groenewoudseweg 2, Eindhoven, The Netherlands.

### 2. Related Appeals and Interferences

There are no known related appeals or interferences at this time.

### 3. Status of the Claims

Claims 1-21 are pending in the application. No claims are cancelled; and no claims are withdrawn from consideration. Claims 1-21 are the subject of the present Appeal. Claims 1-21 have been finally rejected. Rejected claims 1-21 are duplicated in the Appendix.

### 4. Status of Amendments

A final Office Action on the merits was mailed on July 26, 2007. A Notice of Appeal was filed on October 26, 2007.

### 5. Summary of the Claimed Subject Matter<sup>1</sup>

In accordance with a representative embodiment, a data communication system (see Fig. 3) comprises a transmitter (shown in block diagram form in Fig. 1) having first and second transmitting antennae (See Figs. 1 and 3; and reference characters 36, 38). The signal path of the first antenna (36) exhibits a different delay than the signal path of the second antenna (38) (See page 5, lines 15-23 and page 61 lines 1-5). The system also includes a receiver (shown in block diagram form in Fig. 2) having third and fourth receiving antennae (See Figs. 2 and 3 and reference characters 36, 38), the signal path of the third antenna (36) exhibiting a different delay (See page 5, lines 24-30 and page 6,

<sup>1</sup> In the description to follow, citations to various reference numerals, drawings and corresponding text in the specification are provided solely to comply with Patent Office Rules. It is emphasized that these reference numerals, drawings and text are representative in nature, and in not any way limiting of the true scope of the claims. It would therefore be improper to import any meaning into any of the claims simply on the basis of illustrative language that is provided here only under obligation to satisfy Patent Office rules for maintaining an Appeal.

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lines 1-5) than the signal path of the fourth antenna (38). (Kindly refer to claim 1; page 5, line 31-page 6, line 12; and page 7, lines 7-13 of the filed application).

In accordance with another representative embodiment, a WLAN system (see Fig. 3) comprises an access point (70) having a transceiver coupled to first and second transceiving antennae (See Fig. 3, and reference characters 36, 38). The signal path of the first antenna (36) exhibits a different delay than the signal path of the second antenna (38) (See page 5, lines 15-23 and page 6 lines 1-5). The WLAN system includes one or more mobile terminals (80a, 80b, 80c, 80d) each having a transceiver coupled to third and fourth transceiving antennae (36, 38). The signal path of the third antenna (36) exhibits a different delay than the signal path of the fourth antenna (38) (See page 5, lines 24-30 and page 6, lines 1-5). (Kindly refer to claim 12; page 5, line 31-page 6, line 12; and page 7, lines 7-13 of the filed application).

#### 6. Grounds of Rejection to be Reviewed on Appeal

The issues in the present matter are whether:

- I. Claims 1,2,4,5,9 and 11 are properly rejected under 35 U.S.C. § 102(e) in view of *Tehrani, et al.* (US Patent Publication 20020164963 A1).
- II. Claim 3 is properly rejected under 35 U.S.C. § 103(a) in view of *Tehrani, et al.* and *Thompson, et al.* (IEEE Proceedings on Communications, Vol. 147, No. 6, December 2000.)
- III. Claims 6-8, 10, 12 and 16-21 are patentable over *Tehrani, et al.* and *Joo, et al.* (US Patent Publication 20030095533).

#### 7. Argument

In this portion of the Appeal Brief, arguments are provided. Notably, wherever applicable Applicants maintain previous arguments for patentability provided in response to Office Actions.

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### **I. Rejection in view of *Tehrani, et al.***

Applicants have reviewed the rejection of claims 1,2,4,5,9 and 11 and respectfully submit that a *prima facie* case of anticipation has not been established. At the outset, Applicants rely at least on the following standards with regard to proper rejections under 35 U.S.C. § 102. Notably, a proper rejection of a claim under 35 U.S.C. § 102 requires that a single prior art reference disclose each element of the claim. *See, e.g., W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983). Anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *See, e.g., In re Paulsen*, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990).

Alternatively, anticipation requires that each and every element of the claimed invention be embodied in a single prior art device or practice. *See, e.g., Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *See, e.g., Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991).

### **I. Claim 1**

Claim 1 is drawn to a data communications system that includes:

a transmitter having first and second transmitting antennae (36, 38), the signal path of the first antenna (36) exhibiting a different delay than the signal path of the second antenna (38); and

a receiver having third and fourth receiving antennae (36, 38), the signal path of the third antenna (36) exhibiting a different delay than the signal path of the fourth antenna (38).

*a. different delay in the signal path of the antennae*

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In rejecting claim 1, the Office Action states that *Tehrani, et al.* discloses:  
“...a transmitter having first and second transmitting antennae (figure 1, 120, 138, 140, paragraph 0044, lines 10-12), the signal path of the first antenna exhibiting a different delay than the signal path of the second antenna (this limitation is inherent because in a multipath environment, the signal takes different paths from the source to get to destination and each of these signal experiences different delays as a result each antenna experience different delays. Please see paragraph 0066, lines 1-13) (paragraph 005, lines 7-11);...”

A review of the noted portions of *Tehrani, et al.* do not reveal that the signal paths of the first antenna exhibits a different delay than the signal path of the second antenna, or that this is inherent to the teachings of the reference. In particular, paragraph [0044], lines 10-12 describe a wired network 118 coupled to an AP 120. Each mobile station 110-116 and the AP include two wireless transceivers for transmission and reception of RF energy. This portion of the reference continues by describing that each station has two antennae (e.g., STA M 116 has antennae 134, 136). There is however, no disclosure of different delays between the signal paths of the antennae as claimed expressly described.

The Office Action alleges, however, that this is inherent to the disclosure of *Tehrani, et al.*

Applicants have previously rebutted the position proffered by the Examiner that the noted features of claim 1 relating to delay differences in the respective signal paths of the transmit and receive antennae (36, 38) are inherent to the disclosure of *Tehrani, et al.* Applicants bolster their position in the present Appellant's Brief.

As noted in the Response under Rule 111, M.P.E.P. § 2112 IV provides that:

**EXAMINER MUST PROVIDE RATIONALE OR EVIDENCE TENDING  
TO SHOW INHERENCY**

*The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or*



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*characteristic. In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

(emphasis added).

Furthermore, a claim rejection must be based on objective evidence of record, and cannot be supported merely on subjective belief and unknown authority. See, e.g., M.P.E.P. § 2144.03; *In re Lee*, 277 F.3d at 1344-45, 61 USPQ2d at 1434-35 (Fed. Cir. 2002); *In re Zerko*, 258 F.3d at 1386, 59 USPQ2d at 1697.

No such evidence has been provided that the delay in the signal path as claimed in necessarily present. To wit, the final Office Action states:

"Path delays limitation is inherent because multipath delays between transmit and receive antennas are well known concept in radio frequency communication. One of ordinary skilled [sic] in the art would have clearly recognized that in wireless telecommunications, multipath is the signal propagation phenomenon that results in radio signals reaching the receiving antenna by two or more paths. Multipath causes interference, shift in phase and amplitude and also time delay of the received signal. This is a basic concept of radio frequency communication which is documented in many RF communication text books.

Furthermore, in paragraph 0066, lines 1-13, Tehrani, et al. clearly discloses that "The RF energy that is transmitted between antennas can experience destructive and constructive

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interference due to multiple paths taken by the energy with multiple delays on the way to a receive antenna". This provides a clear evidence for path delay between antennas and establishes a solid support for the inherency."

a. The Office Action Fails to Establish that the Claimed Delay in Signal Paths is Necessarily Present in *Tehrani, et al.*

First, as noted above, the fact that something **may** be present is not enough to establish inherency. Thus, extrinsic evidence is necessary to prove that the 'something' **must** be present. In the first paragraph of the Office Action reproduced above, there is no such evidence provided, but rather an explanation of what can cause delay between the transmit and receive functions of a transceiver. There is no evidence that it is inherent that in *Tehrani, et al.* for example, that the signal path of the first antenna exhibits a different delay than the signal path of the second antenna as specifically claimed.

Second, the noted portion of paragraph [0066] does not provide evidence that the delay as claimed **must** exist. Again, this portion of *Tehrani, et al.* merely states the one cause of interference **can be** due to multiple paths taken and multiple delays. Thus, this portion of the reference discloses a possible cause of multipath delay, but does not provide evidence that multipath delay **must** be present as claimed.

Finally, Applicants have sought an affidavit under 37 C.F.R. § 1.104(d)(2) from the Examiner. Such an affidavit has not been provided.

Because evidence of inherency has not been provided, and because the reference fails to disclose at least one feature of each of claim 1, a *prima facie* case of anticipation has not been established. Thus, claim 1 is patentable over the applied art. Moreover, claims 2-11, which depend from claim 12 are patentable over the applied art for at least the same reasons and in view of their additionally recited subject matter.

**II. Rejection in view of *Tehrani, et al.* and *Thompson, et al.***

Claim 3 is rejected under 35 U.S.C. § 103(a) in view of *Tehrani, et al.* and *Thompson, et al.* Claim 3 depends indirectly from claim 1, which is patentable over the applied art for at least the reasons set forth above. While Applicants by no means

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concede the propriety of this rejection, claim 3 is patentable over the applied art for at least the same reasons as claim 1.

### III. Rejections in view of *Tehrani, et al.* and *Joo, et al.*

As stated in MPEP § 2143, in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

While Applicants do not concede that the first two criteria are met, because the reference(s) fail to disclose at least one feature of the claims, a *prima facie* case of obviousness has not been established.

#### i. Claims 6-8 and 10

Claims 6-8 and 10 depend directly or indirectly from claim 1, which is patentable over the applied art for at least the reasons set forth above. While Applicants by no means concede the propriety of this rejection, claims 6-8 and 10 are patentable over the applied art for at least the same reasons as claim 1.

#### ii. Claim 12

Claim 12 is drawn to a WLAN system and features:

*"an access point having a transceiver coupled to first and second transceiving antennae (36, 38), the signal path of the first antenna (36) exhibiting a different delay than the signal path of the second antenna (38); and one or more mobile terminals (80a, 80b, 80c, 80d) each having a transceiver coupled to third and fourth (36, 38) transceiving antennae, the signal path of the third antenna (36) exhibiting a different delay than the signal path of the fourth antenna (38)."*

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The Office Action directs Applicants to *Tehrani, et al.* alleging that the signal path of the first antenna exhibiting a different delay than the signal path of the second antenna is inherent and directs Applicants to paragraphs [0066] and [005] for support for this assertion. As discussed in detail above in connection with the demur of the rejection of claim 1, the reference to *Tehrani, et al.* does not expressly disclose the noted feature of claim 12; and a proper showing of inherency has not been provided at least because *Tehrani, et al.* merely states the one cause of interference **can be** due to multiple paths taken and multiple delays. Thus, this portion of the reference discloses a possible cause of multipath delay, but does not provide evidence that multipath delay must be present as claimed. Moreover an affidavit from the Examiner as to personal knowledge that this feature is inherent to *Tehrani, et al.* has not been provided.

Therefore, because the applied art fails to disclose at least one feature of claim 12, a *prima facie* case of obviousness has not been established. Moreover, claims 13-21, which depend immediately or ultimately from claim 12 are patentable over the applied art for at least the same reasons as claim 12.

Although supererogatory in view of the traversal of the rejections for the shortcomings of the applied art set forth above, Applicants respectfully submit that the Office Action fails to establish inherency of at least one other feature of claim 12. Notably, the Office Action is alleging that two antennae are inherent to the teachings of the applied art. To wit, the Office Action states:

To increase the probability of receiving better signals, [sic] diversity technique is used in [sic] wireless communication system. This technique requires two or more antennas (receiver and transmitter) in the one physical housing, which is called a transceiver.

While some transceivers include two antennae, half-duplexing schemes and full-duplexing schemes are prevalent and provide transceivers that have only one antenna. As such, the assertion that the two antennae device **must** be present in a WLAN system is incorrect. As such, because a one antennae device may be used in keeping with the teachings of the applied art, inherency has not been established.

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**c. Rejections improper**

For at least the reasons set forth above, Applicants respectfully submit that a proper *prima facie* case of obviousness has not been established because the applied art does not disclose at least one feature of each of claims 1 and 12 and because the claims of inherency are improper. Therefore, claims 1- 21 are patentable over the applied art.

**8. Conclusion**

In view of the foregoing, applicant(s) respectfully request(s): the withdrawal of all objections and rejections of record; the allowance of all the pending claims; and the holding of the application in condition for allowance.

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Respectfully submitted on behalf of:  
Phillips Electronics North America Corp.



by: William S. Francos (Reg. No. 38,456)

Date: March 17, 2008

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**Appendix**  
**Claims on Appeal**

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Appendix  
Claims on Appeal



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Claims:

1. A data communication system comprising: a transmitter having first and second transmitting antennae (36, 38), the signal path of the first antenna (36) exhibiting a different delay than the signal path of the second antenna (38); and a receiver having third and fourth receiving antennae (36, 38), the signal path of the third antenna (36) exhibiting a different delay than the signal path of the fourth antenna (38).
2. The data communication system of claim 1, wherein a nonzero delay of one of the signal paths of the first and second antennae (36, 38) is different from a nonzero delay of one of the signal paths of the third and fourth antennae (36, 38).
3. The data communication system of claim 2, wherein the value of one of the nonzero delays is twice the value of the other nonzero delay.
4. The data communication system of claim 1, wherein the transmitter further comprises a transceiver which is capable of both transmission and reception at different times by means of the first and second antennae (36, 38); and wherein the receiver further comprises a transceiver which is capable of both transmission and reception at different times by means of the third and fourth antennae (36, 38).
5. The data communication system of claim 1, wherein the data further comprises voice data.
6. The data communication system of claim 1, wherein the data further comprises digital data.
7. The data communication system of claim 1, wherein the RF signal path of the first antenna (36) comprises an RF delay element and an RF adder (40) and the signal path of

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the second antenna (38) comprises an RF adder (40); and wherein the RF signal path of the third antenna (36) comprises an RF delay element and an RF adder (40) and the RF signal path of the fourth antenna (38) comprises an RF adder (40).

8. The data communication system of claim 1, wherein the transmitter further comprises at least one or more of a coder (14) and a guard interval insertion processor (20); and wherein the receiver further comprises at least one or more of a decoder (66) responsive to codes utilized by the coder (14) and a guard interval recognition processor (20).

9. The data communication system of claim 1, wherein the delays comprise RF delays.

10. The data communication system of claim 1, wherein the delays comprise IF delays.

11. The data communication system of claim 1, wherein the delays comprise baseband delays.

12. A WLAN system comprising: an access point having a transceiver coupled to first and second transceiving antennae (36, 38), the signal path of the first antenna (36) exhibiting a different delay than the signal path of the second antenna (38); and one or more mobile terminals (80a, 80b, 80c, 80d) each having a transceiver coupled to third and fourth (36, 38) transceiving antennae, the signal path of the third antenna (36) exhibiting a different delay than the signal path of the fourth antenna (38).

13. The WLAN system of claim 12, wherein a nonzero delay of one of the signal paths of the first and second antennae (36, 38) is different from a nonzero delay of one of the signal paths of the third and fourth antennae (36, 38).

14. The WLAN system of claim 13, wherein the value of one of the nonzero delays is twice the value of the other nonzero delay.

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15. The WLAN system of claim 12, wherein the multiple antennae (36, 38) and different delays provide an (L,L) diversity system exhibiting  $2L$  diversity plus  $10 \log 10(L)$  dB performance.

16. The WLAN system of claim 12, wherein each transceiver further comprises an OFDM system.

17. The WLAN system of claim 16, wherein the OFDM system utilizes one of binary phase shift keying (BPSK), quadrature phase shift keying (QPSK), 16-quadrature amplitude modulation (16-QAM) or 64-QAM.

18. The WLAN system of claim 12, wherein each transceiver further comprises at least one or more of a coder (14) and a guard interval insertion processor (20); and at least one or more of a decoder (66) responsive to codes utilized by the coder (14) and a guard interval recognition processor (20).

19. The WLAN system of claim 12, wherein the delays comprise RF delays.

20. The WLAN system of claim 12, wherein the delays comprise IF delays.

21. The WLAN system of claim 12, wherein the delays comprise baseband delays.

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**Appendix**

**Evidence (None)**

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**Appendix**

**Related Proceedings (None)**